QUANSER
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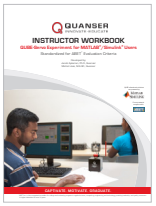
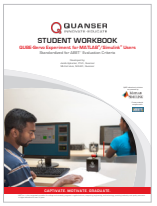
Quick Start Guide: QUBE-Servo USB Interface

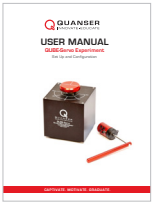
MATLAB SIMULINK

STEP 1 Check Components and Details

Make sure your QUBE-Servo experiment includes the following components:







1. Quanser QUBE-Servo USB Interface
2. Inertia disc module
3. Pendulum module
4. USB 2.0 A/B cable
5. 15V 2.0 A power supply
6. Power cable
7. Instructor Workbook*
8. Student Workbook*
9. User Manual*

*Provided in digital form on the Workstation Resources DVD and online at www.quanser.com/courseware

STEP 2 Additional Components Required for Set Up

To complete the Quanser QUBE-Servo USB Interface set up, you will also need the following:

1. QUARC Real-Time Rapid Control Prototyping Software Installation DVD*
2. Quanser Workstations Resources DVD (includes controllers, User Manual, Quick Start Guide, courseware and other files)

*QUARC software must be purchased separately

STEP 3 Install and Test QUARC

A. Make sure you have all required software, as listed in the QUARC Compatibility Table document located in the QUARC DVD folder.

B. See the QUARC Installation Manual for details on how to install the software.

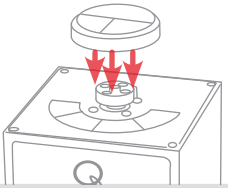
C. Make sure you test the system using the Sine and Scope demo. You can access this by typing **qc_show_demos** in the Matlab prompt.

STEP 4 Set Up the Hardware

The steps below use the Quanser QUBE-Servo USB Interface, with a built-in data acquisition device. If you are using the QUBE-Servo Direct I/O interface systems, please refer to its own Quick Start Guide or the QUBE-Servo User Manual for instructions on connecting to an external data acquisition device (enclosed with shipment).

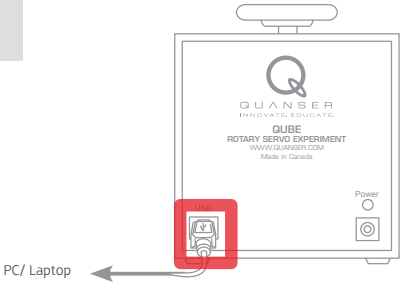
A Place the QUBE-Servo on a flat surface with enough space so that the modules will not be obstructed.

B



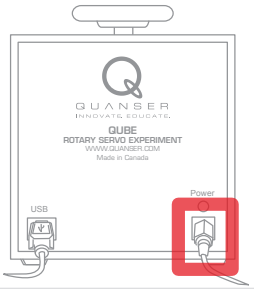
Connect the inertia disc module to the QUBE-Servo base by aligning the inertia disc magnets with the magnets on the QUBE-Servo module connector. The module should snap into place.

C



Using the supplied USB cable, connect the cable from the back cover of the QUBE-Servo to an enabled USB 2.0 port or higher on your desktop PC or laptop.

D



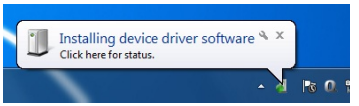
Connect the power connector on the QUBE-Servo to the supplied 15V power supply.

E

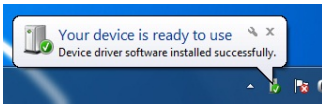
Connect the power supply to a wall outlet using the appropriate power cable.

F The green *Power* LED on the QUBE should turn ON.

G Windows[1] should automatically detect the presence of the QUBE-Servo and attempt to install the driver.



H Upon completion, Windows will notify you that the device is ready for use.



[1]Windows is a registered trademark of Microsoft Corporation in the United States and other countries.

STEP 5 Testing the QUBE-Servo

Follow the procedure below to test your QUBE-Servo experiment.

A

Make sure your PC is powered ON.

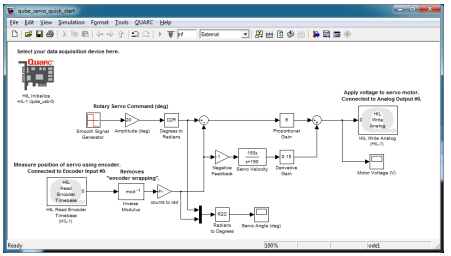
B

On the Resources DVD (supplied with the QUARC package), locate the **Quick Start** folder: Rotary\QUBE-Servo\Quick Start. Copy the **Quick Start** folder to your local hard drive.

Note: Browse online for the latest QUBE-Servo resources at www. quanser.com/courseware

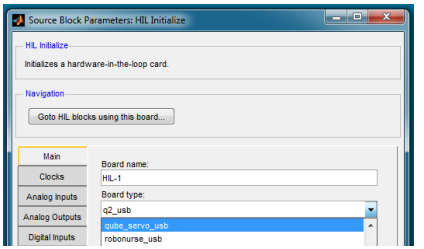
C

Open the Simulink model file (.mdl) found under the **Quick Start** folder on your hard drive.



D

Double-click on the HIL Initialize block and choose the board that is installed on your system (e.g. qube_servo_usb).

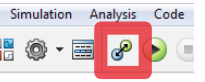


E

Click on the **Build Model** button on the Simulink model toolbar.

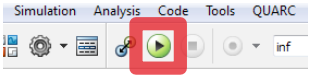
F

Once the model code has been compiled, click on the **Connect To Target** button.

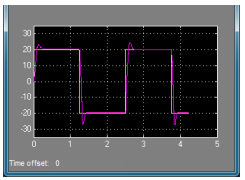


G

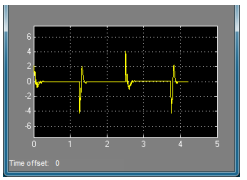
Click on the **Run** button to start the QUARC real-time model.



H



Servo Angle (deg)



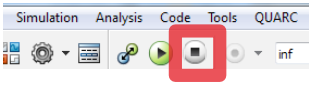
Motor Voltage (V)

The scopes should look similar to those shown here.

The measured servo angle (in purple) should be tracking the desired angle (in yellow) in the **Servo Angle (deg)** scope. The motor voltage is displayed in the **Motor Voltage (V)** scope. If not, consult the Troubleshooting section at the end of this guide.

I

Click on the Simulink **Stop** button to stop the running model



TROUBLESHOOTING

Review the following recommendations before contacting Quanser's technical support engineers.

1. Check the connections outlined in Step 4 of this guide.
2. Make sure cables are firmly connected.

Getting an error when trying to build or run the Quick Start Simulink model (.mdl)

A. Type ver in the *Matlab Command Window* and verify that QUARC is on the list. If not, then go through the QUARC Quick Installation Guide to install QUARC. If it is listed, run *mex -setup* as described in the the QUARC Installation Guide.

You get an 'An operating system specific kernel-level driver for the specified card could not be found' message.

A. Make sure the QUBE-Servo is connected to your PC/laptop with the supplied USB cable to an enabled USB port.

B. Ensure the green *Power* LED on the QUBE-Servo is lit. If not, check that the power supply is operational and properly connected.

C. Ensure the *qube_servo_usb* has been selected as the board type in the HIL Initialize block, as outlined in Steps 5D.

D. Verify that the QUBE-SERVO-USB A and QUBE-SERVO-USB B items appear in Device Manager under the *Universal Serial Bus controllers item.*

The Motor is not responding.

A. Ensure the green *Power* LED on the QUBE-Servo is lit. If not, make sure the power supply is operational and properly connected.

STILL NEED HELP?

For further assistance from a Quanser engineer, contact us at tech@quanser.com or call +1-905-940-3575.

LEARN MORE

To browse and download the latest QUBE-Servo resources, visit www. quanser.com/courseware

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